

# SYLLABUS OF DR. A. P. J ABDUL KALAM MEMORIAL INTRA - SCHOOL MATHEMATICS TALENT SEARCH EXAM- GOKHALE MEMORIAL GIRLS' SCHOOL

## Syllabus For Class 3 Mathematics

### 1. Numbers

#### I. Odd And Even Numbers

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- II. Numbers On The Abacus
  - III. Numbers 21 - 100 On The Abacus
  - IV. Digit Numbers
  - V. Numbers 101 - 200
  - VI. Numbers 201 - 300
  - VII. Numbers 301 - 400
  - VIII. Numbers 401 - 500
  - IX. Numbers 501 - 600
  - X. Numbers 601 - 700
  - XI. Numbers 701 - 800
  - XII. Numbers 801 - 900
  - XIII. Numbers 901 - 1000
  - XIV. Before / After / Between
  - XV. Expanded Form
  - XVI. Place Value
  - XVII. Greater Than / Smaller Than
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#### Addition Of 2 - Digit Numbers

- I. Properties Of Addition - Adding Two Numbers
  - II. Properties Of Addition - Adding Three Numbers
  - III. Adding Three Numbers
  - IV. Adding Three 2 - Digit Numbers
  - V. Adding Two 2 - Digit Numbers With Carry
  - VI. Adding Three 2 - Digit Numbers With Carry
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#### Subtraction Of 2 - Digit Numbers

- I. Subtracting 2 - Digit Numbers With Borrowing
  - II. Addition And Subtraction
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#### Shapes

- I. Plane Figures
  - II. Solid Shapes
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#### Addition Of 3 - Digit Numbers

- I. Adding Two 3 - Digit Numbers Without Carry
  - II. Adding Two 3 - Digit Numbers With Carry
  - III. Adding Three 3 - Digit Numbers Without Carry
  - IV. Adding Three 3 - Digit Numbers With Carry
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#### Subtraction Of 3 - Digit Numbers

- I. Subtracting 3 - Digit Numbers Without Borrowing
  - II. Subtracting 3 - Digit Numbers With Borrowing
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#### Multiplication

- I. Multiplication Tables
  - II. Properties Of Multiplication
  - III. Multiplying A 2 - Digit Number By A 1 - Digit Number Without Carrying
  - IV. Multiplying A 2 - Digit Number By A 1 - Digit Number With Carrying
  - V. Multiplying A 3 - Digit Number By A 1 - Digit Number Without Carrying
  - VI. Multiplying A 3 - Digit Number By A 1 - Digit Number With Carrying
  - VII. Multiplying By 10
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#### *Time*

- I. The Clock
  - II. The Calendar
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#### *Geometry*

- I. Points
  - II. Lines
  - III. Line Segments
- 

#### *Division*

- I. Division - Concept
  - II. Division As Repeated Subtraction
  - III. Division On The Number Line
  - IV. Division And Multiplication Are Related
  - V. Division Using Multiplication Tables
  - VI. Properties Of Division
  - VII. Long Division
  - VIII. Division With Remainder
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#### *Fractions*

- I. Half
  - II. Quarter Or One - Fourth
  - III. Three - Quarters Or Three - Fourths
  - IV. One - Third
  - V. Fraction Of Collections
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#### *Money*

- I. Indian Money
  - II. Changing Money
  - III. Conversion Of Rupees To Paise
  - IV. Conversion Of Paise To Rupees
  - V. Addition Of Money
  - VI. Subtraction Of Money
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#### *Metric Measures*

- I. Length
  - II. Measuring Length
  - III. Measuring Line Segments
  - IV. Converting Metres And Centimetres
  - V. Addition Of Length
  - VI. Subtraction Of Length
  - VII. Measuring Weight
  - VIII. Addition And Subtraction Of Weight
  - IX. Measuring Quantity Of Liquid
  - X. Addition And Subtraction Of Volume
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## Syllabus For Class 4 Mathematics

### 1. Numbers

#### I. Digit Numbers

- II. Representing 1000 On The Abacus
  - III. Place Value
  - IV. Place Value And Expanded Form
  - V. Ordering Of Numbers
  - VI. Odd And Even Numbers
  - VII. Successor And Predecessor
  - VIII. Roman Numerals
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#### Addition

- I. Adding 4-Digit Numbers Without Carry Over
  - II. Digit Addition With Carry Over
  - III. Addition Of Three Or More Numbers
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#### Subtraction

- I. Subtracting 4-Digit Numbers Without Borrowing
  - II. Digit Subtraction With Borrowing
  - III. Addition And Subtraction
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#### Multiplication

- I. Multiplying 3- And 4-Digit Numbers By A 1-Digit Number
  - II. Multiplying By 10, 20, 30, .., 90
  - III. Multiplying By 100, 200, , 900
  - IV. Multiplication Tables 11-20
  - V. Multiplying By A 2-Digit Number
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#### Division

- I. Dividing A 2-Digit Number By A 1-Digit Number
  - II. Dividing A 3-Digit Number By A 1-Digit Number
  - III. Division With Remainder
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#### Fraction

- I. Fraction Of Collection Of Objects
  - II. Addition Of The Fraction With The Same Denominator
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- III. Subtraction Of Fractions With The Same Denominator
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#### Money

- I. Conversion Of Rupees Into Paise
  - II. Conversion Of Paise To Rupees
  - III. Addition Of Money
  - IV. Subtraction Of Money
  - V. Multiplication Of Money
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#### Metric Measures

- I. Length
  - II. Conversion Of Length
  - III. Addition Of Length
  - IV. Subtraction Of Length
  - V. Weight
-

- VI. Conversion Of Weight
  - VII. Addition Of Weight
  - VIII. Subtraction Of Weight
  - IX. Volume And Capacity
  - X. Conversion Of Volume And Capacity
  - XI. Addition Of Volume And Capacity
  - XII. Subtraction Of Volume And Capacity
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*Time*

- I. The Calendar
  - II. The Clock
  - III. A.M And P.M
  - IV. Conversion Of Time
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*Geometry*

- I. Point
  - II. Line
  - III. Line Segment
  - IV. Measuring Line Segments
  - V. Drawing Line Segments
  - VI. Plane Figures
  - VII. Solid Shapes
  - VIII. Faces, Edges And Corners
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*Pictographs*

- I. Pictographs
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**Syllabus For Class 5 Mathematics**

1. Numbers

- I. Extending The Number System
  - II. Ordering Of Large Numbers
  - III. The International Place Value System
  - IV. Roman Numerals
  - V. Digit Numbers
  - VI. Place Value In 5 - Digit Numbers
  - VII. Digit And 8 - Digit Numbers
  - VIII. Writing 6 - Digit And 7 - Digit Numbers
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*The Four Operations*

- I. Addition
  - II. Subtraction
  - III. Multiplication
  - IV. Division
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*Multiples And Factors*

- I. Multiples
  - II. Factors
  - III. Prime And Composite Numbers
  - IV. Tests Of Divisibility
- 

*Hcf And Lcm*

- I. Hcf
  - II. Lcm
-

- III. Prime Factorisation
  - IV. Hcf By Prime Factorisation
  - V. Lcm By Division Method
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#### *Fractions*

- I. Fractions
  - II. Equivalent Fractions
  - III. Types Of Fractions
  - IV. Comparing Fractions
  - V. Adding Fractions
  - VI. Subtracting Fractions
  - VII. Adding And Subtracting
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#### *Decimals*

- I. Converting Fractions Into Decimals
  - II. Converting Decimals Into Fractions
  - III. Equivalent Decimals
  - IV. Expanded Form Of Decimals
  - V. Comparing Decimals
  - VI. Addition Of Decimals
  - VII. Subtraction Of Decimals
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#### *Metric Measures*

- I. Length
  - II. Mass
  - III. Capacity
  - IV. Converting From Higher To Lower Units
  - V. Converting From Lower To Higher Units
  - VI. Addition And Subtraction Of Metric Measures
  - VII. Subtraction
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#### *Time*

- I. Units Of Time
  - II. Conversion Of Time - Hours And Minutes
  - III. Conversion Of Time - Minutes And Seconds
  - IV. Conversion Of Time - Bigger Units
  - V. Addition Of Time
  - VI. Subtraction Of Time
  - VII. The 24 - Hour Clock
  - VIII. Calendar
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#### *Money, Profit And Loss*

- I. Money
  - II. Conversion Of Rupees And Paise
  - III. Addition And Subtraction Of Money
  - IV. Multiplication And Division Of Money
  - V. Profit And Loss
  - VI. Finding Selling Price
  - VII. Finding Cost Price
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#### *Geometry*

- I. Angle
  - II. Types Of Angles
  - III. Closed Figures
  - IV. Circle
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#### *Perimeter*

- I. Perimeter
- 

#### *Pictograph*

## Syllabus For Class 6 Mathematics

### 1. Large Numbers

- I. The Indian Place - Value System

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- II. Expanded Form
- III. Order Relations
- IV. The International Place - Value System
- V. Addition And Subtraction
- VI. Multiplication
- VII. Division
- VIII. Dividing 5 - Digit And Higher Numbers By A 2 - Digit Number
- IX. Dividing 5 - Digit And Higher Numbers By A 3 - Digit Number

#### Tests Of Divisibility

- I. Basic Tests Of Divisibility
- II. Other Tests Of Divisibility

#### Factors, H.C.F And L.C.M.

- I. Factors And Multiples
- II. Prime Factors
- III. Finding Prime Factors Of A Number
- IV. Factor Tree
- V. Highest Common Factor ( H.C.F. )
- VI. Lowest Common Multiple ( L.C.M. )

#### Fractions

- I. Revision
- II. Multiplying A Fractional Number By A Whole Number
- III. Multiplicative Inverse Or Reciprocal
- IV. Dividing A Fractional Number By A Whole Number
- V. Dividing A Whole Number By A Fractional Number
- VI. Dividing A Fractional Number By A Fractional Number

#### Decimals

- I. Revision - Concept
- II. Converting Fractions With 10, 100 As Denominators Into Decimals
- III. Converting Decimals Into Fractions
- IV. Like And Unlike Decimals
- V. Ordering Of Decimals
- VI. Addition Of Decimals
- VII. Subtraction Of Decimals
- VIII. Addition And Subtraction Of Decimals
- IX. Multiplication Of A Decimal Number By A Whole Number
- X. Multiplication Of A Decimal Number By 10, 100, 1000
- XI. Multiplication Of A Decimal Number By A Decimal Number
- XII. Division Of A Decimal Number By A Whole Number
- XIII. Division By 10, 100, 1000
- XIV. Division Of A Decimal Number By A Decimal Number
- XV. Converting A Fractional Number Into A Decimal Number

#### More About Numbers

- I. Rounding Numbers
- II. Roman Numerals

#### Percentages

- I. Expressing Fractions As Percentages
  - II. Converting Percentages To Fractions
  - III. Expressing Percentages As Decimals
  - IV. Expressing Decimals As Percentages
  - V. Finding Percentage Of A Number
  - VI. Money And Metric Measures As Percentages
  - VII. Why Do We Use Percentages?
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#### *Profit And Loss*

- I. Profit And Loss Expressed As A Percentage
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#### *Metric Measures*

- I. Length
  - II. Mass
  - III. Capacity
  - IV. Converting From Higher To Lower Units
  - V. Conversion Of Lower Units To Higher Units
  - VI. Addition And Subtraction Of Metric Measures
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#### *Area And Volume*

- I. Area
  - II. Area Of A Rectangle Or Square
  - III. Finding Length Or Breadth
  - IV. Perimeter
  - V. Volume
  - VI. Volume Of A Cube
  - VII. Volume Of A Cuboid
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#### *Geometry - Lines And Angles*

- I. Concept Of A Plane
  - II. Angles
  - III. Types Of Angles
  - IV. Types Of Lines
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#### *Geometry - Circles, Triangles And Nets*

- I. Circles
  - II. Chord Of A Circle
  - III. Construction Of Circles
  - IV. Interior And Exterior Of A Circle
  - V. Circumference
  - VI. Triangles
  - VII. Types Of Triangles
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#### *Algebra*

- I. Constants And Variables
  - II. Addition And Subtraction
  - III. Coefficients
  - IV. Algebraic Expressions
  - V. Value Of An Algebraic Expression
  - VI. Like And Unlike Terms
  - VII. Simplification
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## Syllabus For Class 7 Mathematics

### 1. Numbers

- I. Comparing Numbers
- II. Large Numbers In Practice
- III. Estimation
- IV. Using Brackets
- V. Roman Numerals

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#### *Whole Numbers*

- I. Introduction
- II. Whole Numbers
- III. The Number Line
- IV. Properties Of Whole Numbers
- V. Patterns In Whole Numbers

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#### *Playing With Numbers*

- I. Introduction
- II. Factors And Multiples
- III. Prime And Composite Numbers
- IV. Tests For Divisibility Of Numbers
- V. Common Factors And Common Multiples
- VI. Some More Divisibility Rules
- VII. Prime Factorization
- VIII. Highest Common Factor
- IX. Lowest Common Multiple
- X. Some Problems On Hcf And Lcm

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#### *Basic Geometrical Ideas*

- I. Introduction
- II. Points
- III. A Line Segment
- IV. A Line
- V. Intersecting Lines
- VI. Parallel Lines
- VII. Ray
- VIII. Curves
- IX. Polygons
- X. Angles
- XI. Triangles
- XII. Quadrilaterals
- XIII. Circles

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#### Angles

- I. Concept of An Angle
- II. Supplementary Angles
- III. Complementary Angles
- IV. Adjacent Angles
- V. Linear Pair
- VI. Vertically Opposite Angles

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#### *Understanding Elementary Shapes*

- I. Introduction
  - II. Measuring Line Segments
  - III. Angles Right And Straight
  - IV. Angles Acute, Obtuse And Reflex
  - V. Measuring Angles
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- VI. Perpendicular Lines
  - VII. Classification Of Triangles
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### *Integers*

- I. Integers
  - II. Addition Of Integers
  - III. Subtraction Of Integers With The Help Of A Number Line
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### *Fractions*

- I. Introduction
  - II. A Fraction
  - III. Fraction On The Number Line
  - IV. Proper Fractions
  - V. Improper And Mixed Fractions
  - VI. Equivalent Fractions
  - VII. Simplest Form Of A Fraction
  - VIII. Like Fractions
  - IX. Comparing Fractions
  - X. Addition And Subtraction Of Fractions
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### *Decimals*

- I. Subtraction Of Decimals
  - II. Addition Of Numbers With Decimals
  - III. Introduction
  - IV. Tenths
  - V. Hundredths
  - VI. Comparing Decimals
  - VII. Using Decimals
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### *Data Handling*

- I. Introduction
  - II. Recording Data
  - III. Organisation Of Data
  - IV. Pictograph
  - V. Interpretation Of A Pictograph
  - VI. Drawing A Pictograph
  - VII. A Bar Graph
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### *Mensuration*

- I. Introduction
  - II. Perimeter
  - III. Perimeter Of The Triangle
  - IV. Area
  - V. Perimeter of Rectangles and Squares
  - VI. Area of Rectangles and Squares
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### *Algebra*

- I. Introduction
  - II. Matchstick Patterns
  - III. The Idea Of A Variable
  - IV. More Matchstick Patterns
  - V. More Examples Of Variables
  - VI. Use Of Variables In Common Rules
  - VII. Expressions With Variables
  - VIII. Addition of Algebraic Expressions
  - IX. Subtraction of Algebraic Expressions
  - X. Multiplication of Monomials
  - XI. Multiplication of Two Binomials
  - XII. Using Expressions Practically
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*Ratio And Proportion*

- I. Introduction
- II. Ratio
- III. Proportion
- IV. Unitary Method

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*Practical Geometry*

- I. The Circle
  - II. A Line Segment
  - III. Perpendiculars
  - IV. Angles
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**Syllabus For Class 8 Mathematics**

Chapter1: Integers

- 1.1 Division of Integers
- 1.2 Multiplication of Integers
- 1.2 Properties of Addition and Subtraction of Integers
- 1.2 Properties of Multiplication of Integers

Chapter2: Fractions and Decimals

- 2.1 Division of Decimal Numbers.
- 2.2 Division of Fractions.
- 2.3 Multiplication of Decimal Numbers.
- 2.3 Multiplication of Fractions.

Chapter3: Data Handling

- 3.1 Chance and Probability .
- 3.2 Collection, Organisation and Analysis of Data.
- 3.2 Double Bar Graphs.
- 3.2 Mode and Median.

Chapter4: Simple Equations

- 4.1 Applications of Simple Equations
- 4.2 Simple Equations
- 4.3 Solving Simple Equations

Chapter5: Lines and Angles

- 5.1 Pairs of Angles.
- 5.2 Pairs of Lines.
- 5.3 Relation Between Angles.

Chapter6: The Triangle and its Properties

- 6.1 Lengths of the Sides of a Triangle.
- 6.1 Medians and Altitudes of Triangles.
- 6.1 Properties of a Triangle.
- 6.1 Pythagoras Property.

Chapter7: Congruence of Triangles

- 7.1 Congruence of Triangles.
- 7.2 Introduction to Congruence.

Chapter8: Comparing Quantities

- 8.1 Application of Percentage.
- 8.2 Equivalent Ratios and Comparison.

8.3 Introduction to Percentage.  
8.4 Profit and Loss Percent  
8.5 Simple Interest

Chapter9: Rational Numbers

9.1 Addition and Subtraction of Rational Numbers.  
9.2 Introduction to Rational Numbers.  
9.3 Multiplication and Division of Rational Numbers  
9.4 Rational Numbers on Number Line

Chapter10: Practical Geometry

10.1 Construction of Parallel Lines.  
10.2 Construction of Triangles.

Chapter11: Perimeter and Area

11.1 Area and Circumference of a Circle.  
11.2 Area and Perimeter of Squares and Rectangles.  
11.3 Area of Parallelograms and Triangles.

Chapter12: Algebraic Expressions

12.1 Addition and Subtraction of Algebraic Expressions.  
12.2 Parts of an Algebraic Expression.  
12.2 Using Algebraic Expressions.

Chapter13: Exponents and Powers

13.1 Exponents and Their Uses.  
13.2 Large Numbers in Standard Form.  
13.3 Laws of Exponents.

Chapter14: Ratio and Proportion

Chapter15:Percentage

Chapter16:Profit and Loss(Discount and Vat Excluded)

Chapter 17:Simple Interest

Chapter 18: Squares and Square roots

Chapter 19: Polygons

Chapter20: Visualising Solid Shapes

20.1 Building 3-D Shapes.  
20.2 Visualising Solid Objects.

## **Syllabus For Class 9 Mathematics**

### **Chapter 1:NUMBER SYSTEMS**

#### **REAL NUMBERS**

1. Representation of natural numbers, integers, rational numbers on the number line. Representation of terminating / non-terminating recurring decimals, on the number line through successive magnification. Rational numbers as recurring/terminating decimals.
2. Examples of non-recurring / non-terminating decimals. Existence of non-rational numbers (irrational numbers) such as  $\sqrt{2}$ ,  $\sqrt{3}$  and their representation on the number line. Explaining that every real number is represented by a unique point on the number line and conversely, every point on the number line represents a unique real number.
3. Existence of  $\sqrt{x}$  for a given positive real number  $x$  (visual proof to be emphasized).
4. Definition of  $n$ th root of a real number.

5. Rationalization (with precise meaning) of real numbers of the type  $1/(a+b\sqrt{x})$  and  $1/(\sqrt{x}+\sqrt{y})$  (and their combinations) where  $x$  and  $y$  are natural number and  $a$  and  $b$  are integers.
6. laws of exponents with integral powers. Rational exponents with positive real bases (to be done by particular cases, allowing learner to arrive at the general laws.)

## Chapter 2: POLYNOMIALS

Coefficients of a polynomial, terms of a polynomial and zero polynomial.

Degree of a polynomial. Constant, linear, quadratic and cubic polynomials.

Monomials, binomials, trinomials.

Factors and multiples.

Zeros of a polynomial.

Remainder Theorem

Factor Theorem.

Factorization of  $ax^2 + bx + c$ ,  $a \neq 0$  where  $a$ ,  $b$  and  $c$  are real numbers, and of cubic polynomials

Recall of algebraic expressions and identities

identities:

$$(x + y + z)^2 = x^2 + y^2 + z^2 + 2xy + 2yz + 2zx$$

$$(x \pm y)^3 = x^3 \pm y^3 \pm 3xy(x \pm y)$$

$$x^3 \pm y^3 = (x \pm y)(x^2 \pm xy + y^2)$$

## Chapter3: Rational Numbers

3.1 Associative and Distributive Properties of Rational Numbers

3.2 Closure and Commutative Properties of Rational Numbers

## Chapter4: Linear Equations in One Variable

4.1 Equations Reducible to the Simpler Forms.

4.2 Solving Equations Having the Variable on Both Side.

4.3 Solving Equations Having the Variable on One Side.

## Chapter5: Geometry

5.1 Lines and Angles

5.2 The Triangle and its Properties

5.3 Lengths of the Sides of a Triangle.

5.4 Medians and Altitudes of Triangles.

5.5 Properties of a Triangle.

5.6 Pythagoras Property.

5.7 Congruence of Triangles (Basic concept)

## Chapter6:

Area of a triangle using Heron's formula (without proof) and its application in finding the area of a quadrilateral.

## Chapter7: Data Handling

- 7.1 Chance and Probability.
- 7.2 Histograms.
- 7.3 Introduction to Statistics.
- 7.4 Pie Chart or Circle Graph

Chapter8: Squares and Square Roots

- 8.1 Finding Square Root by Division Method.
- 8.2 Finding Square Root by Prime Factorisation.
- 8.3 Patterns of Square .
- 8.4 Squares

Chapter9: Cubes and Cube Roots

- 9.1 Cube Root.
- 9.2 Introduction to Cubes and Their Patterns.
- 9.3 Perfect Cubes.

Chapter10: Algebraic Expressions and Identities

- 10.1 Multiplying Polynomials.
- 10.2 Division of Polynomials
- 10.3 Standard Identities.

Chapter11: Visualising Solid Shapes

- 11.1 Mapping Space around Us.
- 11.2 Polyhedrons.
- 11.3 Views of 3D-Shapes

Chapter12: Mensuration

- 12.1 Area of a General Quadrilateral and a Polygon.
- 12.2 Area of Trapezium.
- 12.3 Surface Area and Volume of a Cube and a Cuboid.
- 12.4 Surface Area and Volume of a Cylinder.

Chapter13: Exponents and Powers

- 13.1 Expressing Small Numbers in Standard Form.
- 13.2 Negative Exponents

Chapter14: Factorisation

- 14.1 Common Errors.
- 14.2 Division of Algebraic Expressions.
- 14.3 Factorisation using Algebraic Identities.
- 14.4 Methods of Factorisation.

Chapter15: Introduction to Graphs

- 15.1 Coordinates and the Cartesian Plane.
- 15.1 Line Graphs.
- 15.1 Linear Graphs.

Chapter16: Playing with Numbers

- 16.1 Games with Numbers.
- 16.2 Letters for Digits.

## Syllabus For Class 10 Mathematics

### UNIT I: NUMBER SYSTEMS

#### 1. REAL NUMBERS

- Representation of natural numbers, integers, rational numbers on the number line. Representation of terminating / non-terminating recurring decimals, on the number line through successive magnification. Rational numbers as recurring/terminating decimals.
- Examples of non-recurring / non-terminating decimals. Existence of non-rational numbers (irrational numbers) such as  $\sqrt{2}$ ,  $\sqrt{3}$  and their representation on the number line. Explaining that every real number is represented by a unique point on the number line and conversely, every point on the number line represents a unique real number.
- Existence of  $\sqrt{x}$  for a given positive real number  $x$  (visual proof to be emphasized).
- Definition of  $n$ th root of a real number.
- Rationalization (with precise meaning) of real numbers of the type  $1/(a+b\sqrt{x})$  and  $1/(\sqrt{x}+\sqrt{y})$  (and their combinations) where  $x$  and  $y$  are natural number and  $a$  and  $b$  are integers.
- laws of exponents with integral powers. Rational exponents with positive real bases (to be done by particular cases, allowing learner to arrive at the general laws.)

13. H.C.F and L.C.M of Real Numbers(Using Euclids Division Lemma, Prime Factorisation Method)

### UNIT II: ALGEBRA

#### 1. POLYNOMIALS

Coefficients of a polynomial, terms of a polynomial and zero polynomial.

Degree of a polynomial. Constant, linear, quadratic and cubic polynomials.

Monomials, binomials, trinomials.

Factors and multiples.

Zeros of a polynomial.

Remainder Theorem

Factor Theorem.

Factorization of  $ax^2 + bx + c$ ,  $a \neq 0$  where  $a$ ,  $b$  and  $c$  are real numbers, and of cubic polynomials

Recall of algebraic expressions and identities

identities:

$$(x + y + z)^2 = x^2 + y^2 + z^2 + 2xy + 2yz + 2zx$$

$$(x \pm y)^3 = x^3 \pm y^3 \pm 3xy(x \pm y)$$

$$x^3 \pm y^3 = (x \pm y)(x^2 \pm xy + y^2)$$

Relationship Between the Zeroes and the Co-efficients of a Polynomials

To find a Polynomial when Sum and Product of 2 roots are given.

#### 2. LINEAR EQUATIONS IN TWO VARIABLES

linear equations in one variable. Introduction to the equation in two variables.

linear equations of the type  $ax+by+c=0$ .

a linear equation in two variables has infinitely many solutions

Graph of linear equations in two variables

Solvability of System of Pair of Linear Equations

Method of Solving Pair of Linear Equation(Substitution,Elimination,Cross Multiplication)

problems from real life, including problems on Ratio and Proportion and with algebraic and graphical solutions

UNIT III: COORDINATE GEOMETRY

### 1. COORDINATE GEOMETRY

The Cartesian plane, coordinates of a point, names and terms associated with the coordinate plane, notations, plotting points in the plane.

UNIT IV: GEOMETRY

### 1. LINES AND ANGLES

1. If a ray stands on a line, then the sum of the two adjacent angles so formed is  $180^\circ$  and the converse.
2. If two lines intersect, vertically opposite angles are equal.
3. Results on corresponding angles, alternate angles, interior angles when a transversal intersects two parallel lines.
4. Lines which are parallel to a given line are parallel.
5. The sum of the angles of a triangle is  $180^\circ$ .
6. If a side of a triangle is produced, the exterior angle so formed is equal to the sum of the two interior opposite angles.

### 2. TRIANGLES

1. Two triangles are congruent if any two sides and the included angle of one triangle is equal to any two sides and the included angle of the other triangle (SAS Congruence).
2. Two triangles are congruent if any two angles and the included side of one triangle is equal to any two angles and the included side of the other triangle (ASA Congruence).
3. Two triangles are congruent if the three sides of one triangle are equal to three sides of the other triangle (SSS Congruence).
4. Two right triangles are congruent if the hypotenuse and a side of one triangle are equal (respectively) to the hypotenuse and a side of the other triangle.
5. The angles opposite to equal sides of a triangle are equal.
6. The sides opposite to equal angles of a triangle are equal.
7. Triangle inequalities and relation between 'angle and facing side' inequalities in triangles.

### 3. QUADRILATERALS

1. The diagonal divides a parallelogram into two congruent triangles.
2. In a parallelogram opposite sides are equal, and conversely.
3. In a parallelogram opposite angles are equal, and conversely.
4. A quadrilateral is a parallelogram if a pair of its opposite sides is parallel and equal.
5. In a parallelogram, the diagonals bisect each other and conversely.
6. In a triangle, the line segment joining the mid points of any two sides is parallel to the third side and its converse.

### 4. CIRCLES

Through examples, arrive at definitions of circle related concepts, radius, circumference, diameter, chord, arc, secant, sector, segment subtended angle.

1. Equal chords of a circle subtend equal angles at the center and (motivate) its converse.
2. The perpendicular from the center of a circle to a chord bisects the chord and conversely, the line drawn through the center of a circle to bisect a chord is perpendicular to the chord.

There is one and only one circle passing through three given non-collinear points.

3. Equal chords of a circle (or of congruent circles) are equidistant from the center (or their respective centers) and conversely.
4. The angle subtended by an arc at the center is double the angle subtended by it at any point on the remaining part of the circle.
5. Angles in the same segment of a circle are equal.
6. If a line segment joining two points subtends equal angle at two other points lying on the same side of the line containing the segment, the four points lie on a circle.
7. The sum of either of the pair of the opposite angles of a cyclic quadrilateral is  $180^\circ$  and its converse.

## UNIT V: MENSURATION

### 1. AREAS

Area of a triangle using Heron's formula (without proof) and its application in finding the area of a quadrilateral.

### 2. SURFACE AREAS AND VOLUMES

Surface areas and volumes of cubes, cuboids, spheres (including hemispheres) and right circular cylinders and cones.

## UNIT VI: STATISTICS & PROBABILITY

### 1. STATISTICS

Introduction to Statistics: Collection of data, presentation of data - tabular form, ungrouped / grouped, bar graphs, histograms (with varying base lengths), frequency polygons, qualitative analysis of data to choose the correct form of presentation for the collected data. Mean, median, mode of ungrouped data.

### 2. PROBABILITY

#### Syllabus For Class 11 Mathematics

1. Theory of Quadratic Equations
2. Series & Sequences
3. Trigonometry – Associated angle , Compound angle, Transformations of sums and products, Multiple & Sub-multiple angle.
4. 2D – Coordinate geometry—Coordinates, locus, straight line.
5. Set – Relation – Mapping
6. Real Function
7. Limit
8. Measures of Central tendency.
9. Measures of Dispersion.

#### Syllabus For Class 12 Mathematics

- **Mathematical Reasoning**

### 2. Algebra

- (i) Complex Numbers
- (ii) Quadratic Equations
- (iii) Sequences & Series
- (iv) Permutations Combinations



- (v) Mathematical induction
- (vi) Binomial Theorem
- (vii) Matrices

### **3. Trigonometry**

- (i) Angles and Arc lengths
- (ii) Associated angle , Compound angle, Transformations of sums and products, Multiple & Sub-multiple angle.
- (iii) Trigonometric Equations
- (iv) Trigonometric inverse functions
- (v) Properties of triangle

### **4. Calculus**

- (i) Functions & limit-continuity-differentiability
- (ii) Differentiation (1<sup>st</sup> order & higher orders , )
- (iii) indefinite Integration (only basic substitution method)

### **5. Co-ordinate Geometry**

- (i) Basic concepts of Points and their coordinates & Locus
- (ii) The straight line
- (iii) Circles & Conics

### **6. Statistics**

- *Measures of central tendency.*
- Standard deviation

### **7. Probability**

- Basic concept
- Classical Definition of Probability
- Total Probability Theorem